

IN THE CLAIMS:

Please cancel Claims 1-27.

Please add new Claims 28-36.

1 28. (New) A system for analyzing elements in a sample comprising:
2 a combustion member comprising one of a high-frequency heating furnace and an
3 electric resistance furnace for receiving the sample;
4 a source of oxygen gas connected to the combustion member to supply oxygen
5 gas to the combustion member as the sample is heated to gasify the elements in the sample;
6 a sample section means connected to the heating member by an exhaust conduit
7 for sampling at a constant interval and at constant amounts;
8 a dust filter unit operatively connected to the exhaust conduit for removing dust;
9 an oxidizing device operatively connected to the exhaust conduit for oxidizing the
10 gas output of the combustion member;
11 a dehumidifier for dehumidifying the gas output before the gasified elements are
12 analyzed;
13 a mass spectrometer; and
14 a conduit connecting the sampling section to the mass spectrometer whereby the
15 gasified elements are analyzed quantitatively by the mass spectrometer to determine at least an
16 element of C, S, and N to an accuracy of 0.1 ppm.

1 29. (New) The system of Claim 28 further including a feedback circulating system
2 for recirculating the gasified elements to the heating member until all of the elements in the
3 sample are adequately gasified.

1 30. (New) A system for analyzing elements in a steel specimen, comprising:
2 a combustion member for receiving the steel specimen;
3 a source of oxygen gas connected to the combustion member to supply oxygen
4 gas to the combustion member as the sample is heated to gasify the elements in the sample;
5 an exhaust channel from the combustion member for removing the gasified
6 elements;
7 a dust filter unit, operatively connected to the exhaust channel, for removing any
8 oxidized dust;
9 a dehumidifier unit, operatively connected to the exhaust channel, for removing
10 water vapor;
11 an oxidizing device, operatively connected to the exhaust channel, for oxidizing
12 any CO contained in the gasified elements;
13 a sampling section means, connected to the exhaust channel, for sampling at a
14 constant interval and at constant amounts of gasified elements; and
15 a mass spectrometer connected to the sampling section whereby the gasified
16 elements are analyzed quantitatively to determine the elements in the steel specimen.

1 31. (New) The system of Claim 30 wherein the mass spectrometer analyzes the
2 gasified elements to an accuracy of 0.1 ppm.

1 32. (New) The system of Claim 30 further including means for providing an electric
2 field to ionize the gasified elements prior to an introduction into the mass spectrometer including
3 a heatable filament, an electron collecting electrode, an ion producing electrode, and an ion
4 extracting electrode.

1 33. (New) The system of Claim 30 further including a feedback circulating system
2 connected to the heating member and connected downstream of the dust filter unit and upstream
3 of the mass spectrometer to provide a recirculation of the combustion gas containing the
4 elements through the heating member before analysis by the mass spectrometer.

1 34. (New) The system of Claim 33 further including a suction pump operatively
2 connected in the feedback circulating system to feed back the gasified elements until the steel
3 sample is completely combusted.

1 35. (New) The system of Claim 34 further including a valve member for selectively
2 connecting the exhaust channel to either the feedback circulating system or the mass
3 spectrometer.

1 36. (New) The system of Claim 35 wherein the combustion member is selected from
2 one of a high-frequency heating furnace and an electric resistance furnace.